
DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the image processing device and method of communicating image data.

[0002]

[Description of the Prior Art]As indicated to JP,07-222,A-009 a color management system, It comprises CMM (Color Management Module) and a device profile, Using the profile corresponding to the source device before conversion, and the profile corresponding to the destination device after conversion, a color conversion process is performed in order to perform color matching of an input-and-output picture.

[0003]A source profile and the latter profile are called a destination device profile for the former profile.

[0004]For example, in the color conversion process shown in drawing 1, processing changed into a printer color space (printer CMYK) from a scanner color space (scanner RGB) or a monitor color space (monitor RGB) is performed.

[0005]In this case, a source device is a scanner or a monitor, the profile of that scanner or a monitor turns into a source profile, a destination device is a printer and the profile of that printer turns into a destination profile.

[0006]Drawing 2 shows an example of the structure of a device profile.

[0007]A profile is divided into a header and a data storing part, and here to a header. The information used in order to manage profiles, such as device information which shows of which device (example . monitor) the profile is a thing, and CMM information which shows by which CMM the profile is used, is stored. The profile descriptive information for identifying the profile is stored in the data storing part. The information which shows a manufacture name and a product name, for example is stored in this profile descriptive information.

[0008]

[Problem(s) to be Solved by the Invention]Conventionally, the above color management systems were not realized on the network system. That is, delivery during transmission and reception of the device profile or color management module which are used for a color conversion process was not able to be performed systematically.

[0009]Therefore, it was difficult to realize highly precise color matching in a network system.

[0010]This invention is made in view of the point mentioned above, and it aims at enabling it to realize color matching on a network system.

[0011]Especially this application 1st invention supports color matching processing systematically on a network system, and an object of the invention is to provide the image processing device which enables it to realize color matching processing on a network system efficiently.

[0012]While this application 2nd invention changes an assignment of color matching processing to a network server according to a processing purpose between network terminals, It aims at realizing the increase in efficiency of the color matching processing in a network system by using the image data of resolution according to a processing purpose.

[0013]An object of this application 3rd invention is to realize highly precise color matching processing.

[0014]

[Means for Solving the Problem]To achieve the above objects, this invention has the following constituent features.

[0015]A profile storing means in which this application 1st invention stores two or more profiles corresponding to a device, An image database which stores two or more graphics files corresponding to a picture, and a color processing module storing means which stores a color processing module, It has a means of communication which communicates with a network terminal via a network, Image data which shows arbitrary pictures stored in said image database according to a demand from said network terminal, Arbitrary profiles stored in said color processing module and said profile storing means are downloaded to said network terminal using said means of communication.

[0016]A network server for which this application 2nd invention has a picture this file with data of two or more resolution, It is an image processing method used in a network terminal and a network system which has a network printer, When checking a color matching result with said network terminal, Said network server transmits to said network terminal, and low resolving data in said graphics file said network terminal, When performing color matching processing to said low ****** data, displaying a result of this color matching processing and performing image formation using said network printer, Said network server performs color matching processing to high resolution data in said graphics file, and transmits to said network printer.

[0017]this application 3rd invention is an image processing method used with an image processing device which has a graphics file which stores image data of two or more resolution, Input directions which perform image formation processing using a desired image forming device, and a profile corresponding to said image forming device is inputted, Judge resolution of said image forming device and image data which has the nearest resolution in a thing the same as resolution of said image forming device or high is read, Definition conversion processing which changes resolution of said read image data into resolution of said image forming device is performed, color matching processing is performed to said image data by which definition conversion processing was carried out using said profile, and it transmits to said image forming device.

[0018]

[Embodiment of the Invention]

(Embodiment 1) Below with reference to an accompanying drawing, one example of the suitable embodiment of this invention is explained in detail.

[0019]Drawing 3 is a figure showing one example of the composition of the network system concerning this embodiment.

[0020]Like drawing 3, the network system concerning this embodiment comprises the network 2 to which the network terminal 1, the network server 3, the network printer 4, and said three devices are connected.

[0021]The network terminal 1 is provided with a communication function required for the communication on networks, such as a monitor display and CPU-VRAM required for image processing, and has the monitor descriptive information storage 11 for discernment of a monitor, and the printer descriptive information storage 12 for discernment of the network printer 4.

[0022]The network server 3 is provided with a communication function required for the communication on networks, such as CPU-RAM, a hard disk, etc. required for image processing or a printing job, It has picture DB(database)33 in which the CMM storage 31 into which n CMM (n is a constant) is registered, the profile storage 32 in which m device profiles (m is a constant) (monitor scanner printer) are stored, and a graphics file are stored.

[0023]CMM registered into the CMM storage 31 has the registration information (example . 4 bytes of alphanumeric character) for identifying the kind of CMM, respectively.

[0024]Drawing 4 shows an example of the structure of the graphics file stored in picture DB33.

[0025]here, a graphics file is boiled and divided into the header, low resolution data storing part, and high resolution data storing part for management.

[0026]Information, a source profile, etc. of the color space of the information on the pixel number of the graphics file or a picture are stored in the header.

[0027]The image data of the low resolution used when displaying and outputting with low resolution devices, such as a monitor, is stored in the low resolution data storing part.

[0028]The image data of the high resolution used when outputting to high resolution devices, such as a printer and a printing machine, is stored in the high resolution data storing part.

[0029]When drawing 5 and 6 display the image data in a graphics file in the network terminal 1, according to the characteristic of a monitor of the network terminal 1 by the network terminal 1 side. The flowchart of the processing performed with the network system in the case of performing color matching processing to the low resolution data in a graphics file, and displaying on the monitor of the network terminal 1 is shown.

[0030]The network terminal 1 accesses 3 picture DB33 of a network server via a network, and the graphics file displayed by the monitor of the network terminal 1 is searched with S100.

[0031]In S101, it is confirmed whether the profile is attached to the header information part of the searched graphics file. Here, when the profile is not attached, it judges that there is no necessity for color matching, the low resolution data of a graphics file is downloaded to the network terminal 1, it displays on a monitor, and processing is ended. On the other hand, when the profile is attached, it progresses to S102, a profile is taken out from a header information part, and it downloads to the network terminal 1 as a source profile. Here, source profiles are profiles, such as a scanner and a monitor.

[0032]In S103, the profile of the monitor used as a destination device is required of the network server 3, and it downloads to the network terminal 1.

[0033]In S104, CMM is required of the network server 3 and it downloads to the network terminal 1.

[0034]In S105, low resolution image data is taken out from the low resolution data storing part of a graphics file, and it downloads to the network terminal 1.

[0035]In S106, the monitor profile who downloaded by S103 with the source profile who downloaded by S102 is set to CMM downloaded by S104.

[0036]In S107, color matching processing is performed using CMM set by S106 to the low resolution image data downloaded by S105.

[0037]In S108, based on the color matching data of S107, a picture is displayed on the monitor of the network terminal 1, and processing is ended.

[0038]By processing in this way, a profile and CMM are downloaded from the network server 3, Color matching processing is performed to the low resolution data in the graphics file of picture DB33 by the network terminal 1 side, and it becomes possible to display on the monitor of the network terminal 1.

[0039]That is, since this embodiment is supporting systematically downloading data required for color matching processing via a network with the network system, it can realize color matching on a network with high precision.

[0040]When drawing 7 and 8 print the data of the graphics file stored in picture DB33 using the network printer 4, According to the characteristic of the network printer 4, color matching processing is performed by the network server 3 side to the high resolution data in a graphics file, and the processing flow chart in the case of outputting to the network printer 4 is shown.

[0041]While searching the graphics file which accesses picture DB33 and is printed to the network printer 4 by S200, it directs to perform the printing job for printing with the network printer 4 to the network server 3.

[0042]The network server 3 processes S201-S211, in order to perform a printing job.

[0043]It is confirmed whether the profile is attached to the graphics file searched with S201.

[0044]Progress to S202, when the profile is not attached, order the network server 3 and a monitor profile is made to take out, and it is made to hold to the network server 3 as a source profile here. In this case, it is judged that that picture is a color of a picture to output the color of the picture displayed on that monitor according to the monitor characteristic of the network terminal 1 to. That is, the color of a printing picture is made to match with the color of a monitor of the network terminal 1.

[0045]On the other hand, when the profile is attached, the profile added to the graphics file by S203 is made to take out, and it is made to hold to the network server 3 as a source profile by S204. In this case, a profile turns into profiles, such as a scanner and a monitor.

[0046]A printer profile is taken out by S205 and CMM is taken out by S206, and by S207, a high-resolution image data is taken out from the high resolution data storing part of a graphics file, and it holds, respectively.

[0047]In S208, the printer profile who took out by S205 with the source profile who took out by S202 or S203 is set to CMM taken out by S206.

[0048]In S209, color matching processing is performed S207 using CMM set by S208 to the high-resolution image data held to the server.

[0049]In S210, the data matched by S209 is developed to a bit map on the network server 3 so that an output with the network printer 4 may be possible.

[0050]In S211, the bit map data developed by S210 is transmitted to the network printer 4 via the network 2 from the network server 3.

[0051]In S212, the network printer 4 receives and prints the bit map data transmitted by S211, and processing is ended.

[0052]By processing in this way, order a network server, a required profile and CMM are made to take out, color matching processing is performed to the image data of high resolution by the network server 3 side, and it becomes possible to print with the network printer 4.

[0053]Next, the details of the processing which requires the monitor profile of the monitor of the network terminal 1 performed by S103 of drawing 5 of the network server 3, and is downloaded to the terminal side are shown in drawing 9.

[0054]In S300, the monitor descriptive information which shows the type of a monitor of the network terminal 1 is taken out from the monitor descriptive information storage 11.

[0055]In S301, the profile storage 32 of the network server 3 is accessed.

[0056]The network server 3 performs the following processings according to monitor descriptive information.

[0057]In S302, the profile descriptive information of the data storing part of the head profile of the profile storage 32 is taken out.

[0058]In S303, the profile descriptive information taken out by S302 confirms whether it is in agreement with the monitor descriptive information taken out by S300. When not in agreement, it progresses to S305 and it is confirmed whether the profile which has read the present profile descriptive information is the last.

[0059]When it is the last, it progresses to S307, the default monitor profile of the network server 3 stored in the profile storage 32 is taken out, it downloads to the network terminal 1, and processing is ended. On the other hand, when it is not the last, it progresses to S306, the profile descriptive information of the data storing part of the following profile is taken out, and it returns to S303.

[0060]When in agreement by S303, it progresses to S304, the profile is taken out from the network server 3, it downloads to the network terminal 1, and processing is ended.

[0061]By processing in this way, it becomes possible to require the monitor profile of a monitor of the network terminal 1 of the network server 3, and to download to the terminal side.

[0062]The processing which is performed to drawing 10 and 11 in S104 of drawing 5 and which requires CMM used for color matching processing of the network server 3, and is downloaded to the terminal side is shown in detail.

[0063]In S400, a destination profile's (since it is a case of a monitor display here monitor profile) CMM information is taken out.

[0064]In S401, the CMM storage 31 of the network server 3 is accessed.

[0065]In S402, the CMM information which took out the registration information on head CMM of the CMM storage 31, and was taken out in S403 S402 confirms whether it is in agreement with the CMM information currently held by S400. When in agreement, it progresses to S410. When not in agreement, it progresses to S404 and it is confirmed whether CMM which has read the present registration information is the last. When it is not the last, it progresses to S405, the registration information on following CMM is read, and it returns to S403. On the other hand, in the case of the last, it progresses to S406 and a source profile's CMM information is taken out.

[0066]In S407, access the CMM storage 31 of the network server 3, and by S408. The CMM information which took out the CMM registration information on the head profile of the CMM storage 31, and was taken out by S409 S408 confirms whether it is in agreement with a source profile's CMM information taken out by S406.

[0067]When not in agreement as a result of a check, it progresses to S411 and it is confirmed whether the profile which has read CMM registration information now is the last. If it is the last, it will progress to S412, default CMM of the network server 3 stored in the CMM storage 31 will be taken out and downloaded, and processing will be ended. On the other hand, if it is not the last, it will progress to S412, the CMM registration information on the following profile will be taken out, and it will return to S409.

[0068]When in agreement by S409, it progresses to S410, and the CMM is taken out from the network server 3, is downloaded, and processing is ended.

[0069]By processing in this way, it becomes possible to require CMM used for color matching processing of the network server 3, and to download to the terminal side.

[0070]In S202 of drawing 7, drawing 12 takes out the monitor profile of a monitor of the network terminal 1, and shows in detail the processing held to the network server 3.
[0071]In S800, the descriptive information of the monitor profile of the network terminal 1 is taken out from the monitor descriptive information storage 11.
[0072]In S801, a monitor profile's descriptive information taken out by S800 is transmitted to the network server 3 via the network 2.
[0073]The monitor profile corresponding to the monitor of the network terminal 1 is taken out based on a monitor profile's descriptive information transmitted by S801, by S803, the monitor profile who took out by S802 is held, and processing is ended S802.
[0074]Order the network server 3, the monitor profile of a monitor of the network terminal 1 is made to take out by such processing, and it becomes possible to hold with a server.
[0075]Drawing 13 shows in detail the processing which takes out and holds the monitor profile of a monitor of the network terminal 1 by S802 of drawing 12.
[0076]In S500, the network server 3 receives the monitor descriptive information of a monitor of the network terminal 1.
[0077]In S501, the profile storage 32 of the network server 3 is accessed, and the profile descriptive information of the data storing part of the head profile of the profile storage 32 is taken out in S502.
[0078]In S503, the profile descriptive information taken out by S502 confirms whether it is in agreement with the monitor descriptive information taken out by S500. When not in agreement, it progresses to S505 and it is confirmed whether the profile which has read the present profile descriptive information is the last. If it is the last, it will progress to S507, the default monitor profile of the network server 3 stored in the profile storage 32 will be taken out, and processing will be ended. On the other hand, if it is not the last, it will progress to S506, the profile descriptive information of the data storing part of the following profile will be taken out, and it will return to S503.
[0079]When in agreement by S503, it progresses to S504, the profile is taken out from the network server 3, and processing is ended.
[0080]It becomes possible to order the network server 3 and to take out the monitor profile of a monitor of the network terminal 1 by such processing.
[0081]Drawing 14 shows in detail the processing which is performed in S205 of drawing 7 and which takes out the printer profile of the network printer 4 and is held.
[0082]In S900, the descriptive information of the printer profile of the network printer 4 is taken out from the printer descriptive information storage 11.
[0083]In S901, a printer profile's descriptive information taken out by S900 is transmitted to the network server 3 via the network 2.
[0084]In S902, the printer profile who took out the printer profile of the network printer 4 based

on a printer profile's transmitted descriptive information, and took out by S902 S903 is held with the network server 3, and processing is ended.

[0085]Order the network server 3, the printer profile of the network printer 4 is made to take out by such processing, and it becomes possible to hold with a server.

[0086]Drawing 15 shows in detail the processing which is performed by S902 of drawing 14 and which takes out the printer profile of the network printer 4.

[0087]In S600, the printer descriptive information of the network printer 4 is taken out from the printer descriptive information storage 12.

[0088]In S601, the profile storage 32 of the network server 3 is accessed.

[0089]In S602, the profile descriptive information which took out the profile descriptive information of the data storing part of the head profile of the profile storage 32, and was taken out by S602 S603 confirms whether it is in agreement with the printer descriptive information taken out by S600. When not in agreement, it progresses to S604, the profile descriptive information of the data storing part of the following profile is taken out, and it returns to S603. When in agreement by S603, it progresses to S605, and the profile is taken out from the network server 3, is downloaded, and processing is ended.

[0090]It becomes possible to order the network server 3 and to take out the printer profile of the network printer 4 by such processing.

[0091]Drawing 16 and 17 show in detail the processing which is performed in S206 of drawing 7 and which orders the network server 3, takes out CMM used for color matching processing, and is held with the network server 3.

[0092]In S700, a destination profile's (in the case [In the case of a monitor display] of a monitor profile and printing printer profile) CMM information is held.

[0093]The CMM storage 31 of the network server 3 is accessed, and the registration information on head CMM of the CMM storage 31 is taken out by S702 S701.

[0094]In S703, the CMM information taken out by S702 confirms whether it is in agreement with the CMM information currently held by S700. When in agreement, it progresses to S710.

[0095]On the other hand, when not in agreement by S703, it progresses to S704 and it is confirmed whether CMM which has read the present registration information is the last. When it is not the last, it progresses to S705, the registration information on following CMM is read, and it returns to S703. On the other hand, in the case of the last, it progresses to S706 and a source profile's CMM information is taken out.

[0096]The CMM storage 31 of the network server 3 is accessed, and the CMM registration information on the head profile of the CMM storage 31 is taken out by S708 S707.

[0097]In S709, the CMM information taken out by S708 confirms whether it is in agreement with a source profile's CMM information taken out by S706. When not in agreement, it progresses to S711 and it is confirmed whether the profile which has read CMM registration information now is the last. If it is the last, it will progress to S712, default CMM of the network server 3 stored in the CMM storage 31 will be taken out and downloaded, and processing will be ended. On the other hand, if it is not the last, it will progress to S712, the CMM registration information on the following profile will be taken out, and it will return to S709.

[0098]When in agreement by S709, it progresses to S710, the CMM is taken out from the network server 3, and it holds and ends with the network server 3.

[0099]By such processing, it orders the network server 3, CMM used for color matching processing is taken out, and it becomes possible to hold with the network server 3.

[0100]As explained above, in carrying out color matching processing to image data and displaying on a network terminal in this embodiment, To the low resolution data in a graphics file, a required profile and CMM are downloaded to the network terminal side, and color matching processing is performed by the network terminal side.

[0101]Therefore, since image data is a low resolution, a burden is not placed on the processing by the side of a network terminal.

[0102]In carrying out color matching processing to image data and printing with a network printer, to the high resolution data in a graphics file, a required profile and CMM are taken out by the network server side, and it performs color matching processing by the network server side.

[0103]Therefore, if the grace of printing is taken into consideration, the image data of high resolution will be required, and since processing is heavy, the burden by the side of a network terminal is mitigable in the network terminal side, by performing color matching processing by the network server side.

[0104]That is, according to this embodiment, color matching processing can be efficiently performed as the whole network system.

[0105](Embodiment 2) As the network printer 4, various image forming devices, such as color LBP, an ink-jet printer, and a printer, may be connected. The resolution of a network printer cannot be specified although spread one.

[0106]Therefore, Embodiment 2 explains the gestalt which stores the image data of n kind which has resolution which is different in the graphics file stored in picture DB33 as a modification of Embodiment 1.

[0107]According to Embodiment 2, the following processings are performed in S207 of drawing 7.

[0108]From a printer profile's header information taken out by S205, the resolution of the image data transmitted to the network printer 4 is judged. And the resolution and resolution of a printer choose the same image data or the nearest image data in a high thing from the image data of n kind stored in the graphics file.

[0109]Here, when image data higher than printer resolution is chosen, CPU of the network server 3 performs definition conversion processing to the selected image data, and the image data which has the same resolution as the resolution of a printer is generated.

[0110]Thus, S207 is ended by holding the image data which has the same resolution as the resolution of the obtained printer to the network server 3.

[0111]Since the image data according to the resolution of the printer can be transmitted to a printer according to this embodiment, a quality picture can be formed.

[0112]A quality picture can be outputted while holding down the load concerning definition conversion processing to the minimum, since the nearest image data in a thing the same as the resolution of a printer or high is chosen from a graphics file.

[0113]Since the resolution of a printer is judged from the printer profile who uses for color matching, it can process efficiently.

[0114]The conversion table of the type of a printer and the resolution of a printer is beforehand stored on the network server, and the resolution of a printer may be judged based on the type of the printer obtained from printer descriptive information.

[0115]What is necessary is just to also receive the information which shows the resolution which carries out a printing job, when the resolution of a printer can be changed according to a user's manual directions and printing directions are received from a network terminal.

[0116](Other embodiments) To the computer in the device or system connected with these various devices so that the function of an embodiment mentioned above might be realized and various kinds of devices might be operated. The program code of the software for realizing said embodiment function is supplied, and what was carried out by operating said various devices according to the program stored in the computer (CPU or MPU) of the system or a device is contained under the category of this invention.

[0117]The function of an embodiment which the program code of said software itself mentioned above in this case will be realized, The storage which stored the means for supplying the program code itself and its program code to a computer, for example, this program code, constitutes this invention.

[0118]As a storage which stores this program code, a floppy disk, a hard disk, an optical disc, a magneto-optical disc, CD-ROM, magnetic tape, a nonvolatile memory card, ROM, etc. can be used.

[0119]By executing the program code with which the computer was supplied, OS in which the function of the above-mentioned embodiment is not only realized, but the program code is working in a computer (operating system), Or also when the function of the above-mentioned embodiment is realized in collaboration with other application software, it cannot be overemphasized that this program code is contained in the embodiment of this invention.

[0120]The supplied program code, A part or all of processing that CPU etc. with which the expansion board and a functional storing unit are equipped based on directions of the program code after being stored in the memory with which the function expansion unit connected to the expansion board of a computer or the computer is equipped are actual is performed, Also when the function of an embodiment mentioned above by the processing is realized, it cannot be overemphasized that it is contained in this invention.

[0121]

[Effect of the Invention]As explained above, this application 1st invention can support color matching processing systematically on a network system, and can realize color matching processing on a network system efficiently.

[0122]While this application 2nd invention changes an assignment of color matching processing to a network server according to a processing purpose between network terminals, The increase in efficiency of the color matching processing in a network system by using the image data of resolution according to a processing purpose is realizable.

[0123]this application 3rd invention can realize highly precise color matching processing.

[Translation done.]